

ABSTRACT

The overall objective of this study was to develop approaches to assess the toxicities of several major indoor PM source samples by using human *in vitro* cell models with a focus on inflammatory and oxidative stress responses. In the pilot study, the capacity of extracts from incense PM to stimulate inflammatory marker production in four *in vitro* human cell models was evaluated. The U937 macrophage cell line was the most sensitive of the test models followed by the NCI-H441 bronchiolar Clara cell line.

PM toxicity from cooking activities, candle burning, wood burning, and incense burning was assessed in both cell models. All indoor PM sample source types had some positive response in either or both of the human cell lines with incense producing the largest responses. In further analytical studies, it was determined that incense PM contained high levels of PAHs while woodsmoke had lower levels. Incense also was found to contain many other compounds such as vanillin which may contribute to its high toxicity. Woodsmoke yielded hydrocarbons containing a series of siloxanes. Cooking PM sample from the stir-frying contained mainly hydrocarbons related to the oil used. The candle samples consisted of numerous hydrocarbons such as alkanes and alkenes.

The information from this study will help ARB in the overall assessment of health risk from these indoor sources by providing toxicity data using human cell systems, and provide some initial information for future health effects studies.